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CALIFORNIA DESERT STUDY
SPECIAL MANAGEMENT AREA
PHASE II
ARCHEOLOGY
PALEONTOLOGY
ROGER J. DESAUTELS

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PRESENT SITUATION

THE ARCHEOLOGICAL STATUS OF THE DESERT STUDY AREA

The areas being considered for development by the Bureau of Land Management, as outlined in the Desert Study - Phase II, encompass some of the most important archeological remains in the entire west. The key to many unsolved problems in anthropology and archeology lies in the vast desert regions now being considered for development by the BLM. A partial discussion of the importance of archeological remains in this area was covered by the Desert Study Report - Phase I. The desert, described as "fragile" in this report, contains hundreds of very easily destroyed archeological sites. The archeology of these regions is an irreplacable resource which once destroyed, can never be replaced. There are, for instance, hundreds of sites that bear only surface remains. In 90% of the cases, there is no depth to the archeological deposits and therefore no protection from relic hunters, mining, road building,

and the countless other activities which are taking place or are planned for the future. A scientific collection and study of such sites is just as important as deep middens, rock shelters, and similar situations where protection has been afforded.

Some work has been done in various areas by Universities, Museums, and private individuals but this work has been so restricted by lack of funds and time, that the desert regions have only been scratched in terms of adequate research. The majority of the work to date has been conducted under the auspices of, and with the financial aid of, the National Park Service in areas such as Death Valley, Joshua Tree National Monument, the Anza-Borrego Desert, etc. BLM lands have only been covered by private individuals or institutions who have a particular research problem and organize help on a volunteer or class basis.

The archeological status of these desert areas is critical. Some very important archeological sites, as well as whole areas, have already been destroyed.

This destruction has come about as a result of dozens of activities such as roadbuilding, mining, city development, etc. Most important, however, has been the destruction of archeological remains by "people pressure" which has resulted in the illegal removal of and defacement of archeological sites. The tens of thousands of people who come into the desert each year are destroying these sites at a frantic rate. Motorcycle racing, uncontrolled camping, dune buggy racing, hobbyists collecting rocks and minerals, mining prospectors, hunters, etc., are all, at an ever increasing rate -- destroying these valuable sources of scientific study of our past. Probably the most important single factor has been the activity of the pot hunter or relic collector. These are propie who illegally remove, collect, and deface archeological materials. Some, are local residents. The majority, are people who will and have travelled hundreds of miles to gather "arrowheads" and "pots" for removal to their private homes. The activities of these

people are strictly illegal. There are existing Federal and State Laws which are designed to protect antiquites (See legal section, Addendum (A)) but to date, no really affective enforcement has been implemented.

BLM must assume the leadership and responsibility in the preservation of our archeological heritage in its' development of the desert. The authority to perform these duties are clearly stated in the Bureau of Land Management Manual, Section, 6231, titled, "Management of Antiquities", Section 6231.03. Section 6231.04, clearly defines the responsibility and among other things, states "Lands containing antiquities will be managed so that full public benefit will be realized."

Section 6231.04, titled, "Inventory", states in part, "A thorough, continuing inventory will be made of archeological, historical, and paleontological sites located on lands administered by the Bureau." There has not been, to date, any coordinated management plan in BLM administrated lands. If the BLM

plans for the "desert go forward", there must be incorporated an organized and adequately managed and adequately financed plan to preserve the antiquities in the desert.

The overall lands covered by the Desert Study include approximately 16 million acres. BLM lands, within this unit, number approximately 11 million acres which include 2,231,000 acres in the nineteen priority areas which are earmarked for immediate and extensive development. The task of preserving the archeology within these areas alone is monumental. It is imperative that an adequate program be set up immediately. Archeological sites cannot always be preserved. We realize that the demands upon BLM for other uses of the land and a planned "multiple use" concept must necessarily go into, and disturb, archeological remains. We must be adamant, however, in requesting that the areas that must be so utilized, be surveyed well in advance of development and that archeological materials be gathered and recorded by professional archeologists before they are destroyed. The lack

of existing archeological data on BLM lands is one of the largest problems BLM faces. Approximately 90% of the desert lands in question have never been systematically surveyed by competent archeologists and therefore, thousands of sites exist which have never been recorded. There is no program for surveying and no planned method of recording sites within the area. The present BLM structure provides for the recording of archeological sites if they are found by BLM personnel in the field but no effective use has been made of this system. Forms are provided to each district office for use in recording but our research shows that only an insignificant number of these records are ever filled out or turned in. (See BLM Manual, Section 6231.1, Management of Antiquities). Archeological reconnaissance, however, cannot be expected of the normal employee. Most archeological sites would be completely missed by an untrained employee. Unless some very striking features remained, such as petroglyphs, whole pots, arrowheads,

etc., the vast majority of sites would remain completely obscure and never be noticed. Important sites to the archeologist are not necessarily the late sites with such obvious remains. The recognition of early man sites generally requires the trained eye of a professional.

During the course of the archeological research on Phase II of the Desert Study, we performed several steps which are the basis for our recommendations and planning. These steps are as follows:

1. Existing site records survey - Many sites have already been recorded and these site records are on file at various institutions and museums. As many of these site records were assembled as time would permit. The following, is a list of the sources and the number of sites gained from each.

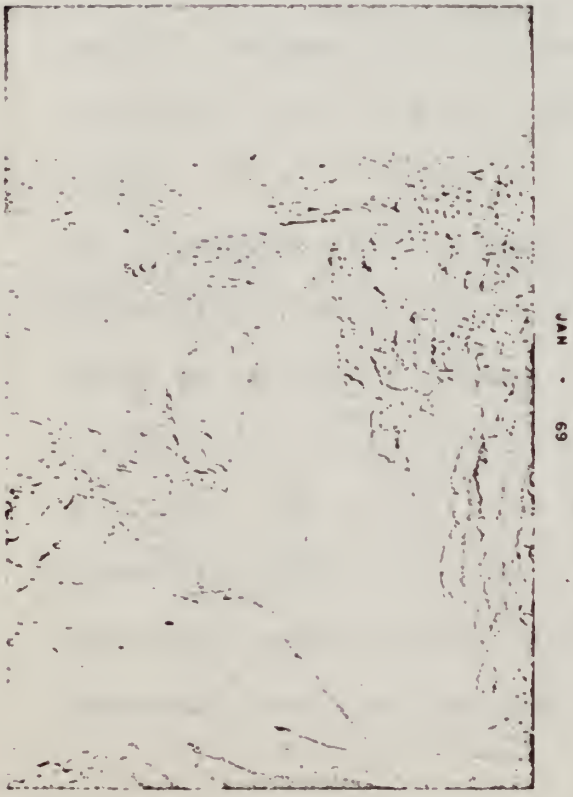
UCLA - Archeological Survey Office	174
BLM - Riverside District - Personal communication and assistance	10
San Diego Museum of Man	353
San Bernardino County Museum	137
University of California at Riverside	0
Pacific Coast Archeological Society	5
Bowers Museum - Santa Ana	5
University of California at Berkeley	300
Personal Communication	25
Survey in the field	39
Total	1048

Site records were collected for the 19 priority areas only and do not include known sites recorded in the balance of the BLM Lands Study area.

2. Survey problems and evaluation tests - Four priority areas were chosen as tests for evaluating the problems faced for future work. Several days were spent in each locality with a crew consisting of from three to ten people. The areas are as follows:

CALICO - Priority I - A heavily used, "people pressure" area close into dense population centers. As expected, we encountered many examples of destruction and vandalism. Petroglyphs at Inscription Canyon for instance, had been defaced and even some pieces removed. Whole portions of basic basalt had been chiseled and knocked away from their matrix and removed. Elsewhere, desert roads lead directly to and through archeological deposits.

Paleontological deposits are being removed at and around Rainbow Canyon. Murphy's Well, Black Canyon, Joshua View, Coyote Lake (dry),

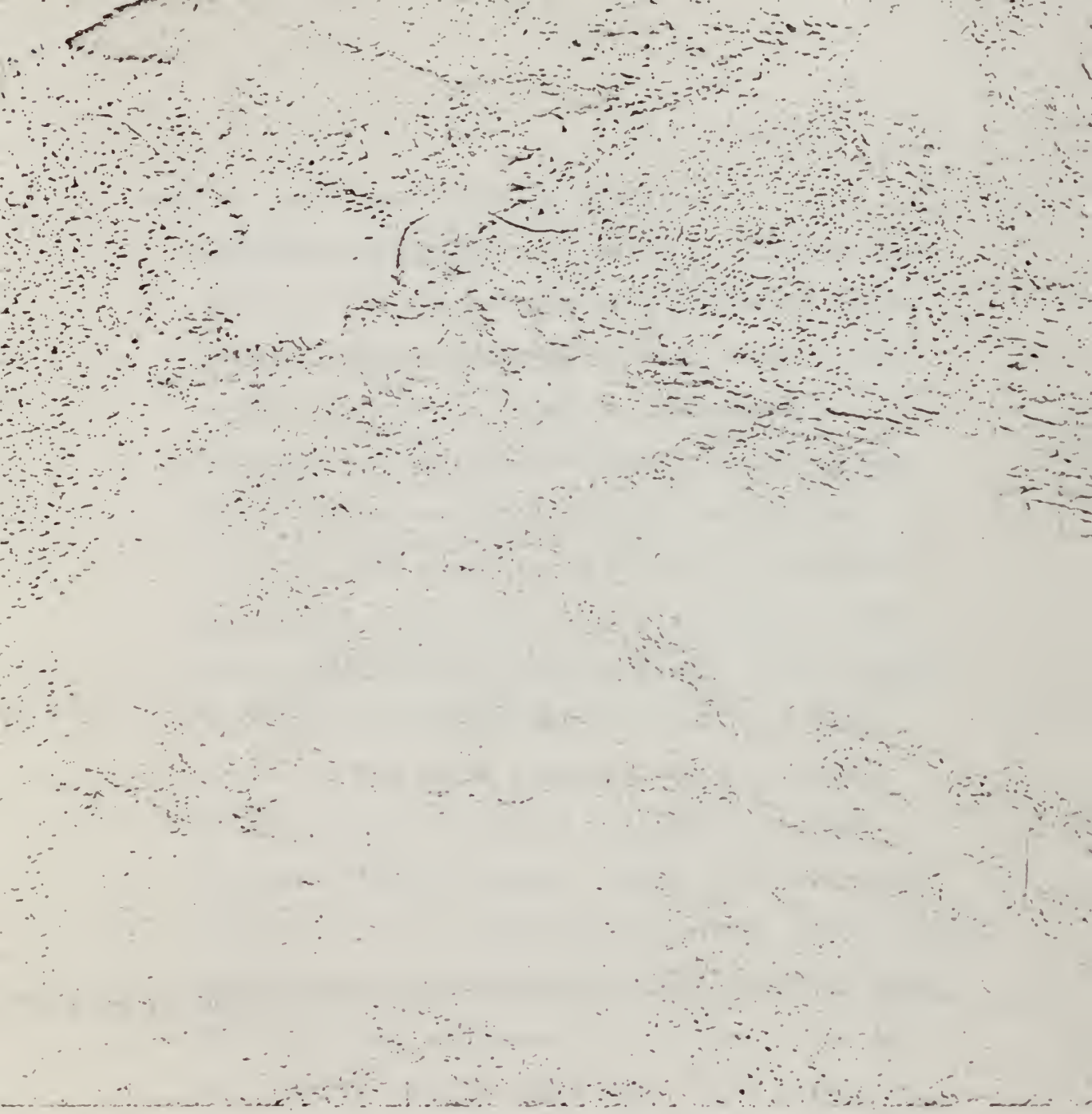


Typical heavy use area at Tin Can Alley. Note the trash problems, the indescriminate shooting of trash barrels and the heavily used surrounding areas where no archeological site could possibly survive.

and Tin Can Alley (appropriately named), showed disturbances by "people pressure". The famous "Early Man" dig near Calico will be within a few miles of one of the proposed campsites.

EASTERN MOJAVE - Priority II - Typical "High Desert" area. We camped at "Hole in the Wall" and surveyed the immediate area and country to the south and east. Hole in the Wall is a glaring example of sites already destroyed. Two rockshelters and accompanying midden have been totally vandalized with only a few scattered metate fragments and an occasional sherd left to indicate that this was once an archeological site.

In this area we also discovered vandalism to petroglyphs with the accompanying warning signs shot up to such a degree that the Federal Law prohibiting their disturbance could no longer be read. One large site in this area with possible midden depth was cut through by an existing desert road. Two rockshelters discovered, revealed pot hunter activity along

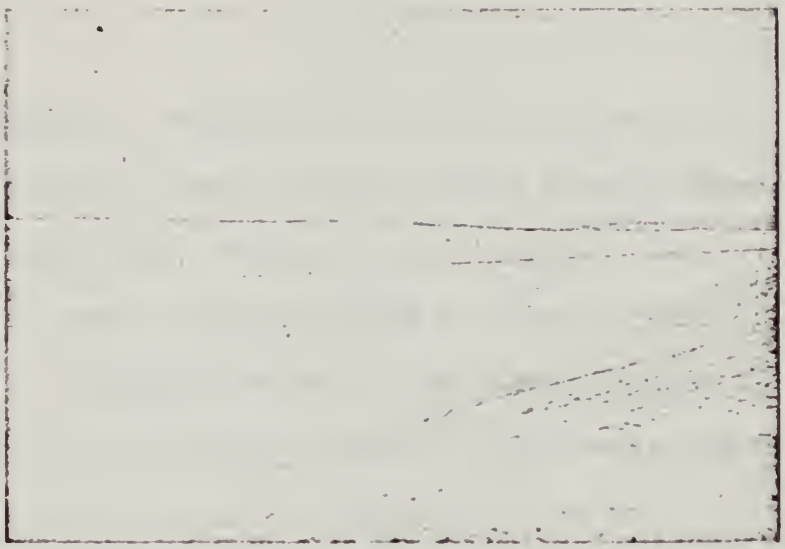


"HOLE IN THE WALL"

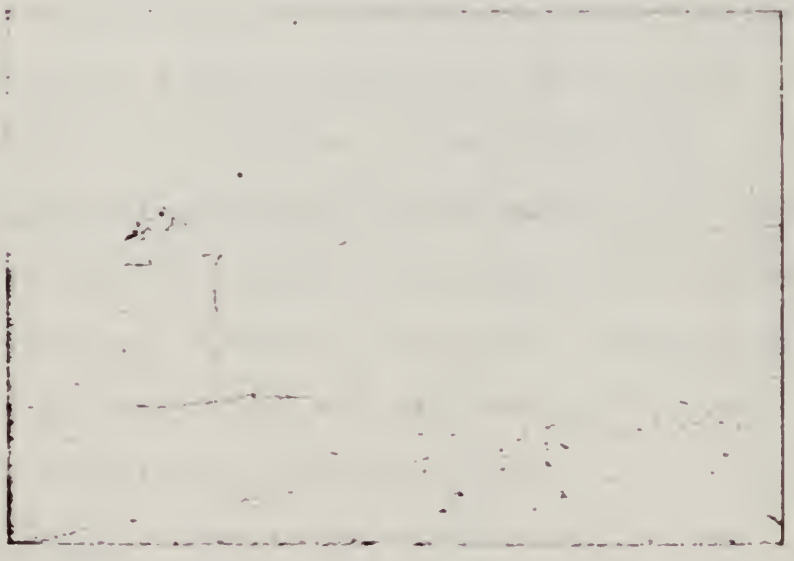
This area is proposed for the installation of a campground and recreation site. It has received very heavy use already. Archaeological remains that were in the immediate area have been completely obliterated and the two rock-shelters cleaned out by campers and pothunters. A few scattered artifacts remained to bear evidence that this was once an aboriginal site.

with the usual beer cans and debris.

IMPERIAL SAND HILLS - Priority I - This is a typical "Low Desert" region highlighted by one of the largest stretches of sand dunes in the world. Besides the obvious "dune buggy" activity, we observed evidence of sites being destroyed by camping and mining activities. We discovered a series of sites on a low sand and gravel ridge which runs from Mammoth Wash in the north to the Mexican Border in the south; a distance of approximately 30 miles. These sites are all being systematically destroyed at this moment by gravel mining up and down the East Highline Canal. These sites are very important to our understanding of the archeological picture in the southeastern portion of the State. Malcolm Rogers mentions two of these sites in his reports some 30 years ago. They appear to be primarily surface sites and should be recorded and collected from immediately before all are lost to the bulldozer.



Imperial Sand Hills - Photos indicate clearly that there is hardly a square yard of area that has not been driven over and disturbed.



YUHA DESERT - Priority I - A very important archeological area near the dense population areas around San Diego. A well known and favorite spot for pot hunters. During the survey, a large site was discovered at Yuha Well where the "Desert Study" plans call for a large recreation and campsite area.
In this area also are examples of the rare Intaglios created by the former Indian inhabitants. One set of these intaglios is presently "protected" by posts and a metal cable which is meant to keep out vehicles. Intaglios, besides being rare, are one of the most fragile archeological features known and should have more adequate protection. Some unthinking tourist visiting the spot could walk out on the area and totally destroy the figures with several well aimed boot trails. It is also tempting for vandals to "add their own impressions" to the area as is evident with petroglyphs.

CORN SPRINGS - Chuckwalla - Priority II - We

conducted archeological tests at the site of Corn Springs in the Chuckwalla area where a campsite is presently being installed. The results were negative so that no delay in construction is anticipated. The petroglyphs, however, should be recorded before any further destruction or vandalism occurs. There are clearly many examples of defacing and alteration. (See photo). This area will be completely disturbed by the installation of the present camping and recreation site.

Arrows indicate typical defacement of petroglyphs. This particular example is at Corn Springs in the Chuckwalla area.

Several tests were run to determine the amount of manpower and time needed to conduct surface surveys. Our desert surveys also brought out factors which should be considered in future archeological surveys. They are summarized as follows:

1. No single individual should survey alone in the desert areas. The hazards involved make it dangerous as well as inefficient to conduct archeological survey work alone.
2. The most efficient team would be a party consisting of four members who worked in pairs of two. This creates a unit which can efficiently cover large areas (the only way to surface survey is to walk), collect specimens rapidly, record and photograph the sites quickly, and "leap frog" the efforts so that there is continuous and efficient coverage.
3. A good four wheel drive vehicle is mandatory. The areas being considered are beyond the reach of conventional vehicles, especially on a continuous day after day basis.

4. It required at least two full days to set up a base camp and familiarize the crew with the overall area to be surveyed. This would include the time to reach the area, find a suitable base camp, establish camp, and make a reconnaissance of the general area.

5. Some means of protection and storage is mandatory. An area, room, or tent, protected from the elements, must be available or established to allow for maintaining records, writing notes, cataloguing and storing artifacts.

6. Several tests were run which averaged out the time required to survey units in the field. It was found that one square mile could be completely covered in approximately three hours by a pair of two man teams (four men), recording an average of one site per square mile unit. This included the time necessary to collect, record, and photograph the site. Specific areas may vary radically from this estimate, but as a general rule, this could be considered an average.

Almost all types of sites were encountered during the test

surveys. The types of sites encountered included surface sites, midden sites, rockshelters and caves, petroglyphs and pictographs, intaglios, rock figures, and historical sites.

Time factors in survey must allow for adverse weather conditions (which may completely halt the project), mechanical breakdown with vehicles, and the very necessary rest periods required by the crew.

The archeological program as suggested by this report is covered by three basic needs.

I. Critical development.

II. Immediate development.

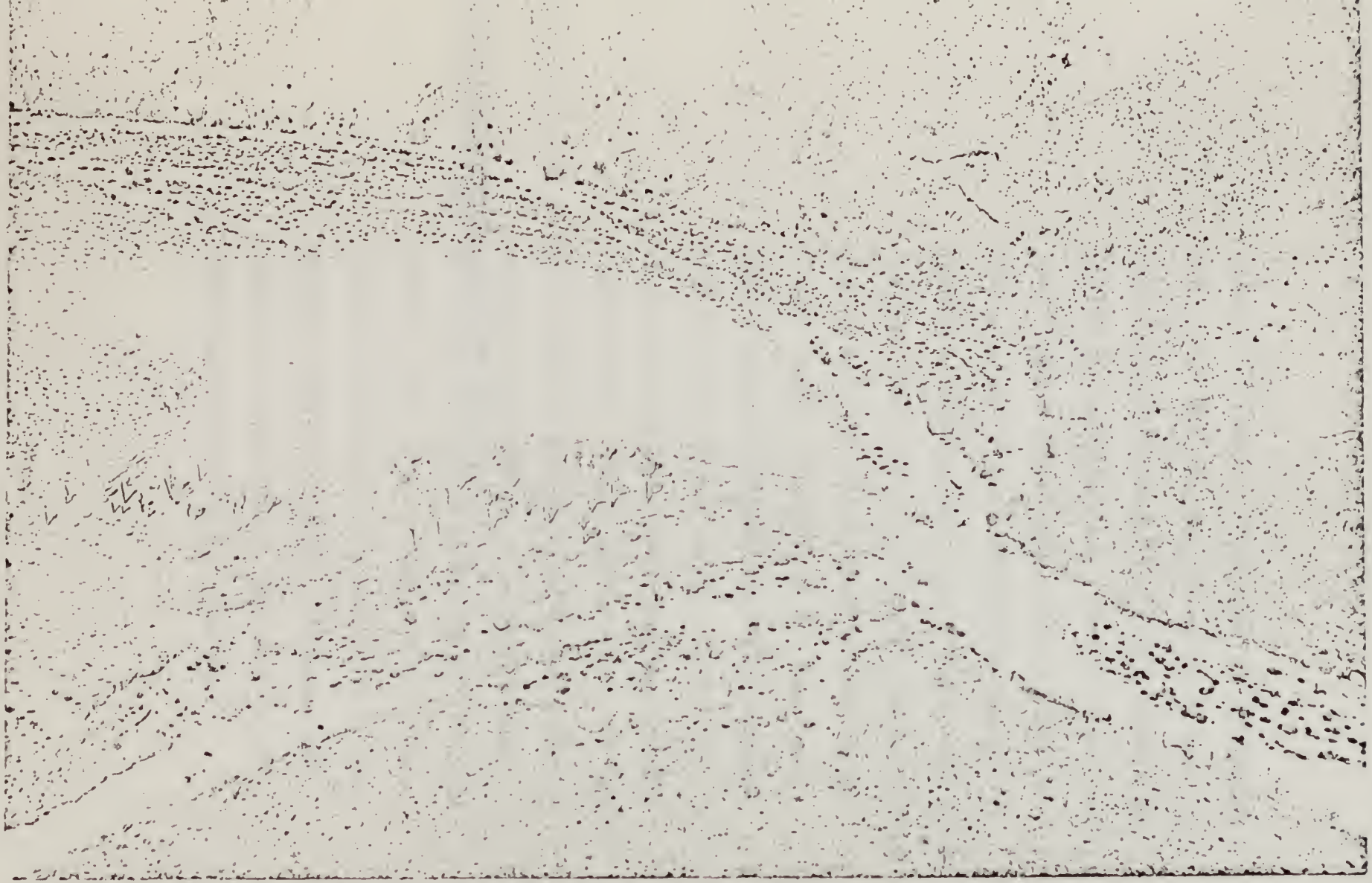
III. Orderly progress and continuation.

I - Critical Development - Certain areas of BLM land are at this very moment being developed by the building of roads and campsites, the leasing of land for grazing and mining, and the unrestricted, uncontrolled use of federal lands for recreation which are every day allowing the destruction of archeological resources. These areas should be attended to immediately with whatever means are available on an emergency basis. These areas would include:

(A) All petroglyph and pictograph sites which are available to the general public via maintained access (dirt) roads and especially those indicated on existing travel maps, USGS maps, etc. Inscription Canyon (Calico), Black Canyon (Calico),

Corn Springs (Chuckwalla), and Grass Canyon (Eastern Mojave), are exellent examples.

(B) All campsites and roads which are presently being constructed and the areas surrounding these. Corn Springs petroglyphs for instance, should be immediately recorded and photographed before further vandalism occurs. The area immediately surrounding the campground should be surveyed for archeological sites before the attraction of a campsite draws hundreds of more people to the Canyon. A minimum of at least one mile in every direction should be covered to insure protection. Some campers will roam further than this radius but most of the damage will be done within this area. The areas around Wylie Well and Coon Hollow (Chuckwalla) where campsites and recreation areas are presently being constructed, should be



CORN SPRINGS (Chuckwalla Area) - Blue dots indicate the location of bedrock mortars. Red areas indicate the locations of petroglyphs. The pink area designates the area under construction for campsites and recreation.

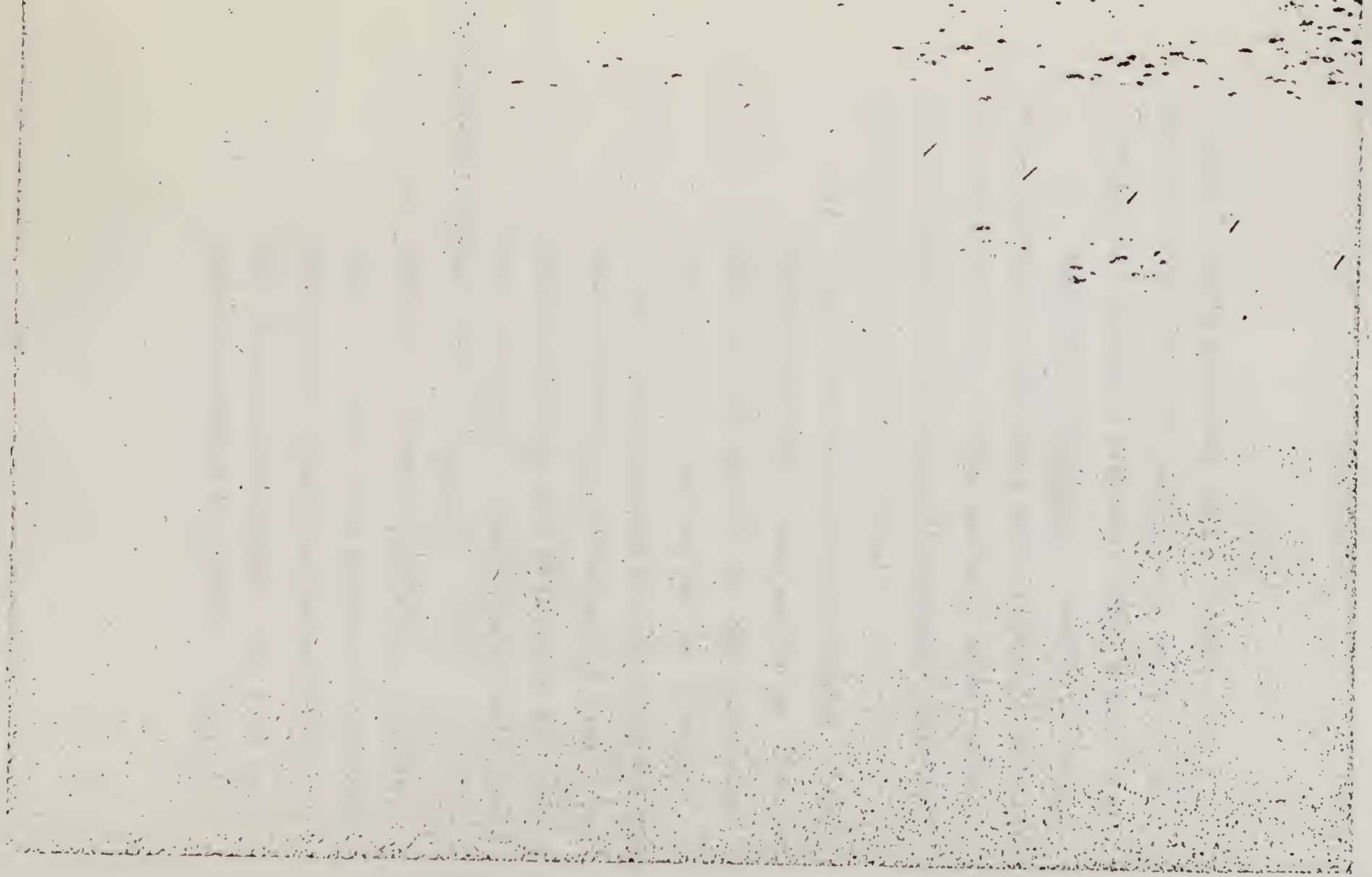
surveyed at once. The area of Wildhorse Canyon in Eastern Mojave where a new road will be constructed this year, should be looked at immediately. The existing jeep trail (the approximate route of the new road), already cuts through a known, recorded archeological site - UCLA - AS #366. Further road work will destroy some of the midden and the added traffic over this eleven miles afforded by the new road will further endanger six archeological sites in the entire area. This site should be tested and the whole Canyon surveyed immediately. The access road to be built next year in the Tufa Pinnacles area is another that should be surveyed soon.

(C) All areas around existing campsites and heavily used areas. Hole in the Wall (Eastern Mojave), Owl Canyon (Calico), Rainbow Canyon (Calico), Mammoth Wash (Imperial Sand Hills), Tin Can Alley (Calico), being specific examples.

(D) All archeological areas presently being destroyed. The sites which exist along the western side of Imperial Sand Hills near the East Highline Canal. These sites are being obliterated by gravel mining activity. Bulldozers are moving the sand and gravel hills which contain the raw materials for the gravel industry. Many sites are endangered and some have already been totally destroyed.

(E) Immediate and more adequate protection for the Yuha Desert Intaglios and any others in similar circumstances. The fragile nature of these remains is evident from the accompanying aerial photo. Circular tire tracks can be seen to have destroyed parts of the intaglios.

Archeological reconnaissance should generally be conducted well ahead of planned activities. The occassion may arise where an archeological site, endangered by development, would be important enough to cause the changing of plans so that it may be pre-



YUHA DESERT - INTAGLIOS

Note circular tire tracks partially obliterating patterns

served. Survey performed well in advance could result in the saving of considerable money in the planning and designing stages of other activities.

II - Immediate Development - Immediate development encompasses activities which should be initiated as soon as possible. These projects cannot wait for future planning before being instigated. The most important of these are as follows:

(A) A systematic and continuing survey of the nineteen priority areas should be initiated and should be part of the next five year accomplishments and as soon as possible. It will require months of work to cover these areas completely and the survey should be completed before more activities are planned or initiated. (See summary table for man months and costs).

(B) Completion of the accumulation of information on known sites should be continued. These records should be standardized so that they are all uniform. The site records included as an addendum to this

report, represent those that are already known for the 19 priority areas only. More research is necessary to make them complete. These records should be expanded to include all BLM lands in the Desert Study Area. Some system of keeping the records current should also be instigated. Annual checks through the National Park Service, with the key institutions in California, would keep the BLM archeological files in good order.

(** next page)

(C) All activities, such as roadbuilding and campsite building, should contain a provision for archeological investigation. All areas should be checked in the planning stage before specific areas and access routes are adopted. The costs of archeological survey testing, and salvage, should be considered a part of the construction costs for the project.

(D) All areas now in the planning stage should

** Bureau of Land Management district and field personnel should constantly be kept aware of archaeological work under way in their areas. They should receive copies from the BLM Washington Office and State Office, of all USDI "Application for Permit Under the Antiquities Act" forms received from institutions in order that they make comment thereon. They should also be cognizant of the Antiquity Act permits issued by the Departmental Consulting Archaeologist and all reports prepared by these archaeologists in fulfillment of the permit requirements.

69 . NAC

Typical campsite installation at Owl Canyon near Fossil Canyon. Developments like these increase the "people pressure" in these areas. This is why it is so important that these sites be archaeologically investigated before construction.

69 . NAC

be surveyed. A list of these areas and maps showing their location are contained in the addendum. (B)

(E) A program should be set up to maintain better laison with other activities that take place in the desert with special attention given to the mining industry. As the present mining laws exist, there is no provision for protecting sites which could be destroyed by mining activities, exploratory activities, and the hundreds of miles of access roads that continuously are bulldozed without regard for archeological remains. Mining interests should not be allowed to proceed without knowing whether archeological resources are in jeopardy.*

(F) Some provision for laison with Federal, State, and County road departments should be initiated. These roads, put

*The Land Law Review Commission is presently reviewing the BLM and all federal mining laws. Strong consideration should be given by this commission to archeeological values and their preservation.

through BLM lands, are a constant threat to archeological resources. The archeologist should be notified and provided by the BLM with right of way maps prior to any road, bridge, or dam construction.

(G) Some archeological sites and areas should be set aside permanently for future scientific study. Archeological techniques of excavation and dating, unknown to us today, will be developed in the future and these reserved sites or areas would be very important.

(H) A public relations and educational program is needed to make the public aware of archeological resources and their values. Building respect for irreplacable archeological remains can become a great deterrent in the prevention of vandalism and destruction. This can be accomplished in several ways:

(1) Development of a brochure or pamphlet on archeology (and paleontology) which can be distributed at way stations and/or by BLM personnel in the field.

(2) Development of a "tie-in" with the Johnny Horizon program to inform people of the Federal and State Antiquities laws which protect archeological remains.

(3) Production of a motion picture film on archeology which could be distributed to schools, museums, clubs, educational TV, and private individuals to educate the public and primarily the younger generation on the values of these archeological remains.

(4) Education and instruction to employees within the BLM itself. If our own federal employees have no respect for archeological remains, how can the public be expected to follow suit. All employees who travel in the field

Amen!

should carry the BLM site survey forms and be familiar with how they are made out. This is explicitly outlined in the BLM manual, "Management of Activities" under Section, 6231.1 "Inventory".

(5) Exhibit centers should be designed and built for educational and informational purposes. Certain Way Stations could be the logical places for these exhibits. In some areas, even full fledged recreations of a typical aboriginal campsite and/or rockshelter could be constructed - wikiups, fireplaces, the entire village complex.

(6) Some selected site should be excavated with the idea in mind of publicly displaying the techniques and methods used by archeologists in unearthing the past. Pits and trenches could be stabilized with actual artifacts, features, and

burials left in place. Walkways could be designed through these so that the public could actually "tour" through a dig. One of the most effective displays in the United States is the La Brea Tar Pits in Los Angeles, California which exhibits the actual excavation and fossil bones in situ.

(I) To properly accomplish the above program, it is essential that the State office of the Bureau of Land Management establish an archeologist position as soon as possible. This individual would coordinate the entire field program as well as accomplish the public relations and interpretive work for the BLM in this significant State study. He would be part of the entire planning and development program.

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III - Orderly Progress and Continuation - The BLM manual clearly states, "a thorough, continuing

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(J) As more and more recreational development occurs on BLM lands, additional people will be required for protective and recreational purposes. Part of the planning package should include personnel to manage and protect all recreational areas after they have been constructed. It does no good to develop an area and then not adequately manage and protect it.

inventory will be made of archeological, historical, and paleontological sites located on lands administered by the Bureau." (BLM Manual - Section 6231 - "Management of Antiquities", Section 6231.1). Plans for the eventual archeological survey of all BLM lands should be formulated. This action, because of the ever increasing population explosion, should be completed after the 19 priority areas and before the year 1995. This is a requirement of the BLM resources inventory. There is a huge increase in the number of students who are going into the fields of Anthropology and Archeology and it is mandatory that we conserve sites for future generations to study. There are enough lands involved in this Desert Study area alone to keep archeological investigation going continuously for many years to come.

In planning roads and campsites, we should not lead the public directly to archeological sites. Inscription Canyon in the Calico area is an excellent example. The present county road which

leads to the petroglyph site takes the visitor directly to the center of the site. The public may drive within a few feet of the petroglyphs with trash barrels provided, which in essence says, "stop here and picnic". The result is quite obvious at the site. Visitors have inscribed their own initials and choice remarks, sometimes directly over and obliterating the originals. Some sections of rock have been actually removed. This vandalism was facilitated in that an automobile or truck could be backed up to the petroglyphs for easy loading. The area is also not adequately posted with antiquities signs.

A partial solution to protection would be to have the access road and "picnic area" lead to a spot somewhere away from the site itself. Just a short ½ mile south of the petroglyphs themselves, is an excellent picnic spot which would require the public to walk a short distance to view the petroglyphs. A path, or indicated path, should be developed which is well posted

with antiquities signs. It has been observed that when the public is required to walk to see some interesting exhibit or natural attraction, that their personal respect increases with each step.

BENEFITS - The benefits of a sound archeological program are the preservation of an irreplacable resource which will be viewed and studied by hundreds of thousands of the public in the future. The value of archeological remains cannot be measured in dollars but rather in terms of the value to a further knowledge of our history and the scientific research necessary to preserve our archeological heritage. There are very few grandiose or spectatular remains in the desert area, as there are in other parts of the world. The desert remains are fragile and the problems are just as scientifically important and just as valuable as those in any other part of the world. These remains are especially significant to the peoples of the United States.

CURRENT LOSSES - Current losses are already tremendous in terms of archeological materials that have already been destroyed, vandalized, and removed. It would be difficult to assess the amount because the overall total of the resource is, as yet, still unknown.

LIMITATIONS - Limitations on archeological planning and the implementation of a program boil down to one critical item - funds. The trained manpower and time are available but the financial wherewithall is lacking.

SPECIAL PROBLEMS - To relieve some of the pressure exerted by pot hunters, certain sites in the desert area could be opened to the public for digging. Archeologists rarely find it necessary to excavate 100% of any given midden to gain an adequate sample of the remains. Some selected sites could be reserved, after scientific excavation, for amateur groups and clubs, school classes, boy scout groups, etc. which would be allowed specific places to dig. These groups and individuals would of course, have to have some degree of professional supervision but it would allow for the release of the urge to dig and collect and perhaps better protect unexcavated sites. Only recognized and qualified archeologists should be allowed to excavate and only after approval by the Department of Interior Archeologist.

the typing of site records, and a descriptive and assembled professional report on the results. Surveying does not include research and/or analysis of the findings, nor the cost of storing the collections.

3 - Recording of petroglyphs and pictographs requires time and patience and would be recorded primarily with photographs and drawings. Actual full size acetate overlays would be made of the more outstanding figures and transfered to paper for the permanent records. This is considered as part of a Salvage Project, and is not part of the Inventory Survey Program.

4 - Figures do not include the purchase of USGS or other maps necessary for the survey. These maps would be supplied by BLM.

5 - Any duplication of forms or records beyond the original would be provided for

COSTS:

The following, are estimates of the costs involved in implementing the proposed programs. These costs are based upon several conditions and factors.

1 - Costs are all inclusive - meaning that one man month in the field includes food, lodging, equipment, photography, vehicles and fuel. These costs are based upon the rate of $1000.00 per man, per month, fully equipped and supplied. These figures could be cut down to $750.00 per man month if the BLM could supply a four wheel drive vehicle.

2 - Costs are based on survey work only. No actual archeological excavation is included. Survey work includes; Physically walking the areas prescribed, collecting specimens, recording and photographing sites, the numbering and cataloguing of specimens, the adequate packaging of specimens,

by the BLM offices as well as the covers and binders necessary for their containment.

6 - All archeological excavation, whether they be test excavations or full fledged digs, would be figured as additional costs. These costs vary radically from site to site and would have to be quoted - based upon individual situations and complexities. Rockshelters and caves, for instance, are usually much more difficult to excavate than middens which are out in the open.

Many people and institutions aided in the production of this report. The actual field work was performed by a crew of hardworking archeologists who underwent many hardships during the field work. The worst month of weather in California in 40 years contributed to conditions of icy cold winds, which at times, almost blew us off of the desert, rain, sleet, hail, and even snow. The crew had to move quickly from place to place with no permanent headquarters, and live under very primitive conditions most of the time.

Those in the field crew were:

Eric Hardesty, Al McCurdy, Terry Anderson, Mark Kalionzes, Jacki Nair, Valerie Nair, Marjorie McCurdy, Patty Desautels, Jo Ann Brady, Robert Drury.

Contributing to the accumulation of site information and aiding in the gathering of materials for the report were:

The University of California at Los Angeles -

Tom King

Alex Apostolides

The San Diego Museum of Man -

Dr. Emma Lou Davis

Miss Ruth Evans

Dr. Clark Evernham

The San Bernardino County Museum -

Jerald A. Smith

Bob Reynolds

Ruth D. Simpson

The University of California at Riverside -

Mark Kowta

The Pacific Coast Archeological Society -

Miss Aileen McKinney

The Bowers Museum - Orange County -

Paul Chase

The University of California at Santa Barbara -

Dr. Claude Warren

The entire staff of the BLM Office - Riverside -

The University of California at Berkeley

SUMMARY TABLE - COSTS - CRITICAL DEVELOPMENT

The following items are critical projects which must be accomplished immediately to preserve areas that are, at this moment, being vandalized and destroyed.

ITEM	MAN MONTHS	COST
1. Survey areas around present campsites, proposed campsites, Way Stations, and new roads. Test excavate where necessary. (Items B & C)	6	$6,000.00
2. Survey and record petroglyph and pictograph sites endangered. Includes tracings and photography.	3	3,000.00
3. Complete master archaeological site record inventory at all major Universities and Museums. Includes the completion of master overlay system of entire BLM desert area.	2½	2,500.00
Totals	11½	$11,500.00

SUMMARY TABLE - COSTS - IMMEDIATE DEVELOPMENT

ACTIVITY	TOTAL SQ. MILES IN AREA	MAN MONTHS	COST *
Survey the following areas:			
1. CALICO (1)	336	14	$14,000
2. IMPERIAL SAND HILLS (1)	456	12	12,000
3. MECCA HILLS (1)	70	1	1,000
4. REDROCK CANYON (1)	18	1	1,000
5. RODMAN MTNS. (1)	741	30	30,000
6. YUHA DESERT (1)	200	8	8,000
7. AFTON CANYON (2)	30	2	2,000
8. BIGHORN-WHITEWATER (2)	405	18	18,000
9. CHUCKWALLA (2)	707	28	28,000
10. EASTERN MOJAVE (2)	1269	38	38,000
11. GRAPEVINE CANYON (2)	52	3	3,000
12. PICACHO (2)	216	8	8,000
13. SANTA ROSA MTNS. (2)	197	8	8,000
14. TUFFA PINNACLES (2)	14	1	1,000
15. FORT PIUTE (3)	9	1	1,000
16. KINGSTON PEAK (3)	77	4	4,000
17. OLD WOMAN MTNS. (3)	88	6	6,000
18. TURTLE MTNS. (3)	132	9	9,000
19. WHIPPLE MTNS. (3)	106	7	7,000
Total	4,923	199	$199,000

Average cost per area:

* The above figures are projections based on a very small test sample. All estimates are subject to revision after test assumptions are verified in the first few surveys. These figures include vehicle provided by the Archeologist. As stated in the text, one man month would cost $750.00 if BLM provided the 4 wheel drive vehicle.

SUMMARY TABLE COSTS - ORDERLY PROGRESS & CONTINUATION

1975 - 1995

The cost for the continuation of the archeological research is hard to assess because we are projecting a plan to encompass work over the next 25 years. Assuming that the costs for Critical and Immediate Development have been set at $203,000 and utilizing the formula that these costs encompass only 1/5th of all of the BLM lands in the Desert Study, then we can project an estimated budget of $800,000 at a ratio of 4 to 1 at todays costs.

SUMMARY - ARCHAEOLOGY

The most important single word that describes the archaeology of the desert is "fragile". The majority of archaeological sites in the desert are "hanging by a thread" in respect to their existence. The ecology of the desert has made man's existence there in the past 20,000 years a continuous fight of survival. The aboriginal inhabitants of the desert generally were forced to move over wide areas in order to maintain life. The southeastern California deserts were also major travel and migration routes for several cultures.

In most archaeological sites in the desert only the surface tools remain to verify the life of this areas once hardy inhabitants. Our knowledge of some of these groups is based entirely upon the collecting and scientific study of these surface remains. In some cases, if an unthinking individual removes even one artifact, a significant bit of knowledge about the ancient inhabitants can be lost. Cases can be cited where the only remaining evidence of trade and contact between cultures has been the finding of a single potsherd.

Many areas are in need of immediate attention and are critical

to our planning and action. Prehistoric expressions of art in the form of petroglyphs, pictographs, intaglios, and rock alignments are at this moment being destroyed or are in danger of extinction. The general public and the pot hunter in particular, completely ignore the values of this resource. By their lack of knowledge, lack of consideration, and sometimes total disregard for the heritage of the past, they "wipe out" pages in the record of history. The majority of the people applying "People Pressure" on this land would be cognizant of their responsibility if they could only be reached through programs of education, understanding, and control.

Tremendous damage has already occured. The destruction will only increase as the population grows and the "People Pressures" build each year. A program must be initiated which allows for coordination and cooperation with other resource developments such as recreation and mining. The BLM is determined to give the people their needed recreation program. They have their goals and also the supporting framework of the Bureau of Land Management regulations clearly defining the obligations and duties of this agency. Federal and State Antiquities laws clearly create the basis

for action.

There is a great need for the continuation and completion of the inventory of archaeological resources. The BLM must obtain a total knowledge of what it has before intelligent recommendations for planning, management, and control of the archaeological resource can be made. There are hundreds of important sites still unknown and undiscovered by the archaeologist.

Archaeological problems are somewhat unique in that to gain a comprehensive knowledge of the resources these surveys cannot be done from aerial photographs or scattered samplings alone. The only correct and valid archaeological survey is the result of walking, area by area, step by step, over the entire physical landscape. The Desert Study priority-areas alone encompass over two million acres! The current work has begun and established a master site record survey which is a solid nucleus for the overall inventory necessary. This accumulation of resource records must be maintained and completed.

Immediate Development points out the need for continuing surveys, completion of the inventory, the improvement of the liaison with other agencies and resources, and the necessity of a good public relations program.

The need for a full-time archaeologist in the State BLM office to assist in the development of the desert is an absolute must. There are problems of planning, research, and public relations that will require the efforts of a full-time scientist directly concerned with the Desert Study area. Qualified personnel and equipment are available for this work. Adequate funds are the only necessary addition that will allow the BLM to accomplish the aims of the program.

The costs involved in implementing the archaeological program are small for critical needs, larger for immediate needs, and much larger for carrying the program on to the projected date of 1995. These costs should be viewed with the thought in mind that they are applied to the preservation of invaluable materials which are used to understand the past of mankind.

The California Desert Study area is one of the most important in the United States. The answers to many anthropological problems lie in this critical region. The BLM can and must assume the ultimate responsibility for the preservation of one of our most important assets. The responsibility is great and the task is monumental in scope, but it is essential that the

information be gathered for ourselves and for future generations.

New roads can be built, plants reseeded, new animals introduced, but once an archaeological site is lost - - it is lost forever!

P A L E O N T O L O G Y

The paleontology of the desert region is commensurate in importance with the archaeological remains. Some of the most important deposits in America exist in the area defined by the BLM Desert Study. All of the Federal and State Antiquities Laws, as well as the National Park Service and BLM regulations, require that these deposits be protected.

Most of the statements made for archaeology in the foregoing report apply to paleontology, including the very important provision that in future work a paleontologist be added to the "team".

The BLM Desert Study region has continued to be of prime paleontological interest ever since the 1920's when J.C. Merriam, of the University of California at Berkeley, began reporting on the fossil mammals from deposits in the "Mud Hills" northeast of Barstow. Subsequent to this the members of the University of California at Berkeley, and later at U.C. Riverside as well, have maintained a strong interest in the paleontology of the desert. M. O. Woodburne of the Department of Geological Sciences, University of California, Riverside, can be said to be the individual now most directly concerned with this

area of interest. Others are involved including R. H. Tedford, formerly of U. C. Riverside, now of the American Museum of Natural History, New York; and G. E. Lewis, U. S. geological Survey, Denver.

The deposits near Barstow (Barstow Formation) are probably some of the most important in North America.. The fossil vertebrates they contain provide the basis for the Barstovian North American Land Mammal Age, the fundamental late Miocene unit of non-marine faunel correlation in this continent. Other areas in the Desert enumerated on the following list demonstrate that localities of paleontological interest are widespread in this region. These range in time from early Miocene to Pleistocene and provide crucial evidence as to the historical mammalian evolution, paleoecology and paleoclimatology of the region. Two of these localities, Daggett and S. Cady Mts. illustrate the fact that the Mojave is still in a pioneering stage of development relative to fossil mammals. These sites are of middle and early Miocene age respectively and were discovered in the last three years. Prior to their discovery, faunas older than late Miocene (Barstow equivalent) were almost unknown in the Mojave, which lead some students to the unwarranted generalization that pre-late Miocene sediments did not exist

on the Mojave.

The following is a list of the areas in the desert region which contain known fossil deposits. They are part of the irreplaceable resource which should be studied and preserved.

1. Barstow-Rainbow Basin — Opal Mtn and Lane Mtn. Quads.
T. 11 N., R. 2 W
Sects. 8-17 21-26
T. 11N., R. 1 W
Sects. 16-21 29, 30

Opal Mtn. & Fremont Peak Quads.

2. Black Mtn., Black Canyon, Gravel Hills.
T. 32 S., R. 44 E
All sects. except 30, 31, 32, 18, and 19.
T. 31 S., R. 33 E
Sects. 19-23 25-36
T. 31 S., R. 43 E
Sects. 19-21 25-30 32-36
T. 32 S., R. 43 E
Sects. 1, 2, 3, 12

3. Daggett Ridge — Daggett and Barstow Quads.
T. 9 N., R. 1 E
Sects.29-32
T. 8N., R. 1 E.
Sects. 5-8 17,18
T. 9 N., R. 1 W.
Sects. 25-27 31-36
T. 8N., R. 1 W
Sects. 1-5 8-12

4. Yermo Hills — Newberry Quad.
T. 10 N., R. 2 E.
Sects. 25,26

5. Harvard Hills — Newberry Quad.
T. 10 N., R. 3 E.
Sects. 21,22,27,28

6. West Cady Mts. — Newberry Quad.
T. 9 N., R. 4 E
Sects. 1, 5, 11-14 36

T. 8 N., R. 4 E
Sect. 1.
T. 9 N., R. 5 E
Sect. 31
T. 8 N., R. 5 E
Sect. 6

7. Southern Cady Mts. — Cady Mtn. Quad.
T. 9 N., R. 5 E
Sect. 4, 9, 10, 11, 13, 14, 15, 22-27
T. 9 N., R. 6 E
Sects. 34, 35, 36
T. 8 N., R. 6 E.
Sects. 1, 2, 3, 10-14

8. Northern Cady Mountains — Cady Mtn. Quad.
T. 10 N., R. 7 E.
Sects. 4-9 16-21
T. 11 N., R. 7 E
Sects. 31, 32
T. 11 N., R. 6 E.
Sects. 31-36
T. 10 N., R. 6 E.
Sects. 1-5 8-17 21-27

9. Alvord Mtn. — Alvord Mtn. Quad.
T. 12 N., R. 4 E.
Sects. 19, 20, 21 27-35
T. 11 N., R. 4 E.
Sects. 2-8

10. Avawatz Mts. — Red Pass Lake and Baker Quads.
T. 15 N., R. 7 E.
Sects. 4-9

11. Afton Canyon, North Cady Mts. — Cave Mtn. Quad.
T. 11 N., R. 7 E.
Sects. 28-33
T. 11 N., R. 6 E.
Sects. 19-36

12. Lava Mts. — Bandsburg and Cuddleback Lake Quads.

T. 28 S., R. 41 E.
Sects. 25-28 33-36
T. 28 S., R. 42 E.
Sects. 13, 19-36
T. 29 S., R. 42 E.
Sects. 1-12
T. 29 S., R. 41 E.
Sects. 1-3 10-12

13. El Paso Mts. — Saltdale and Inyokern Quads.

T. 28 S., R. 39 E.
Sects. 2-11 14-23

14. Ricardo-Redrock Canyon — Saltdale and Cross Mtn. Quads

T. 29 S., R. 37 E.
Sects. 23-28 32-36
T. 30 S., R. 37 E.
Sects. 1-5

15. Piute Valley — Homer Mt. Quad.

T. 13 N., R. 19 E.
Sects. 16, 21, 27, 28, 29, 32, 33

16. Manix — Newberry Quad.

T. 10 N., R. 4 E.
Sects. 3, 4, 9, 10 14-17 20, 21, 22.

17. Valley Wells — Mescal Range Quad.

T. 16 N. R. 12 E.
Sects. 21, 22, 27, 28

18. E. Hackberry Mts. — Lanfair Valley Quad.

T. 11 N., R. 17 E.
Sect. 5.

19. Ship Mts. — Dandy and Cadiz Lake Quads.

T. 5 N., R. 15 E.
Sects. 9-16 21-29 32-35
T. 4 N., R. 15 E.
Sects. 2, 3, 4, 9, 10

Other areas which contain paleontological deposits include: Coyote Mountains (Yuha Desert), Yuha Buttes, Coso Mountains, Providence Mountains, Mecca Hills, and the Panamint Valley.

In summary, the Mojave Desert continues to be an area of definite paleontological significance. It has been shown that well preserved fossil mammals are more widespread, both geographically and temporally than thought formerly. Moreover, as the new thrust in stratigraphic paleontology - refined stratigraphic collecting - continues, old familiar sites as well as those as yet undeveloped, will be subjected to closer scrutiny. This will lead to a better understanding of the indigenous extinct mammalian faunas and more refined correlation and comparison with the better known faunas of the Rocky Mts. and Plains states. Although paleontological study of the Mojave began over 50 years ago, this study is still in a relatively early phase. The potential of the region, in this regard, has only barely been touched.

SUMMARY TABLE - COSTS - IMMEDIATE NEEDS

The following costs are based upon the same work schedules as outlined for the archeological factors. These costs are for survey and sampling work only and do not include excavation.

ITEM	MAN MONTHS	COST
1. Black Mountain, Black Canyon(Calico)	2	$2,000.00
Harvard Hills	1	1,000.00
West Cady Mountains	2	2,000.00
Northern Cado Mountains	2	2,000.00
Avawatz Mountains	1½	1,500.00
Afton Canyon	2	2,000.00
El Paso Mountains	2	2,000.00
Piute Valley	1	1,000.00
Valley Wells	1	1,000.00
East Hackberry Mountains	1	1,000.00
Ship Mountains	1	1,000.00
	16½	$16,500.00
2. Planning and inventory completion	6	6,000.00

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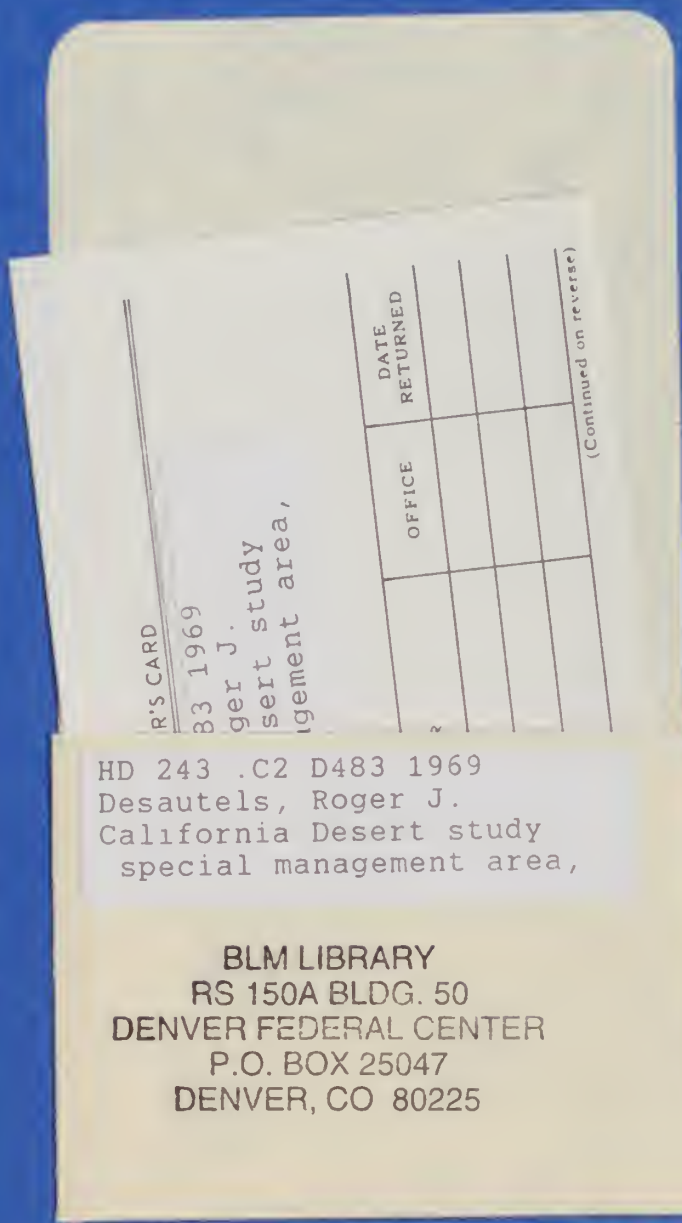

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